Timetable

Wednesday January 8
watch video lectures 1 and 2 and do exercises prior to class
lecture 1 (problem session) from 3:10pm to 5:00pm
Q1, HW1 handed out

Friday January 10
Q1 due by 2:00pm
tutorial 1 from 3:10pm to 4:00pm

Monday January 13
peer review of Q1 due by 4:00pm

Wednesday January 15
watch video lectures 3 and 4 and do exercises prior to class
lecture 2 (problem session) from 3:10pm to 5:00pm
Q2, HW2 handed out

Thursday January 16
HW1 due by 11:59pm

Friday January 17
Q2 due by 2:00pm
tutorial 2 from 3:10pm to 4:00pm

Monday January 20
Q2 due by 4:00pm

Wednesday January 22
watch video lectures 5 and 6 and do exercises prior to class
lecture 3 (problem session) from 3:10pm to 5:00pm
Q3, HW3 handed out

Thursday January 23
HW2 due by 11:59pm

Friday January 24
Q3 due by 2:00pm
tutorial 3 from 3:10pm to 4:00pm

Monday January 27
peer review of Q3 due by 4:00pm

Wednesday January 29
lecture 4 from 3:10pm to 5:00pm

Q4, HW4 handed out

Thursday January 30
HW3 due by 11:59pm

Friday January 31
Q4 due by 2:00pm
tutorial 4 from 3:10pm to 4:00pm

Monday February 3
peer review of Q4 due by 4:00pm

Wednesday February 5
lecture 5 from 3:10pm to 5:00pm
Q5, HW5 handed out

Thursday February 6
HW4 due by 11:59pm

Friday February 7
Q5 due by 2:00pm
tutorial 5 from 3:10pm to 4:00pm

Monday February 10
peer review of Q5 due by 4:00pm

Wednesday February 12
lecture 6 from 3:10pm to 5:00pm

Thursday February 13
HW5 due by 11:59pm

Friday February 14
lecture 7 from 3:10pm to 4:00pm
HW6 handed out

Monday February 17–Friday February 21
Reading Week: no lectures, tutorials, or office hours

Wednesday February 26
midterm from 3:10pm to 5:00pm

Friday February 28
lecture 8 from 3:10pm to 4:00pm

Wednesday March 5
lecture 9 from 3:10pm to 4:00pm
Q6, HW7 handed out

Thursday March 6
HW6 due by 11:59pm

Friday March 7
Q6 due by 2:00pm
tutorial 6 from 3:10pm to 4:00pm

Monday March 10
peer review of Q6 due by 4:00pm
Last day to drop S courses

Wednesday March 12
lecture 10 from 3:10pm to 5:00pm
Q7, HW8 handed out

Thursday March 13
HW7 due by 11:59pm

Friday March 14
Q7 due by 2:00pm
tutorial 7 from 3:10pm to 4:00pm

Monday March 17
peer review of Q7 due by 4:00pm

Wednesday March 19
lecture 11 from 3:10pm to 5:00pm
Q8, HW9 handed out

Thursday March 21
HW8 due by 11:59pm

Friday March 21
Q8 due by 2:00pm
tutorial 8 from 3:10pm to 4:00pm

Monday March 24
peer review of Q8 due by 4:00pm

Wednesday March 26
lecture 12 from 3:10pm to 5:00pm
Q9, HW10 handed out

Thursday March 27
HW9 due by 11:59pm

Friday March 28
Q9 due by 2:00pm

tutorial 9 from 3:10pm to 4:00pm

Monday March 31
peer review of Q9 due by 2pm

Wednesday April 2
lecture 13 from 3:10pm to 5:00pm
Q10 handed out

Thursday April 3
HW10 due by 11:59pm

Friday April 4
Q10 due by 2:00pm
tutorial 10 from 3:10pm to 4:00pm

Monday April 7
peer review of Q10 due by 3:00pm

Topics and Readings

Predicate and propositional logic (pre-recorded lectures 1-4 and problem sessions 1-2)

Mathematics for Computer Science, chapters 1.1–1.2, 3
Learning to Reason, chapter 1
236/240 course notes, chapters 5, 6

propositional logic: negation, conjunction, disjunction, implication
truth tables
contrapositive, converse
predicate logic: universal quantification, existential quantification

O, Ω
validity, satisfiablility, unsatisfiability
disjunctive and conjunctive normal forms
interpretation
prenex normal form

Proofs (pre-recorded lectures 5-6 and problem session 3)

Mathematics for Computer Science, chapters 1.3–1.9
How to Read and Do Proofs
Learning to Reason, chapter 2

substitution
modus ponens
specialization
direct proof
indirect proof
proof by contradiction
proof by cases
generalization
construction
instantiation
existence proofs

Induction

lectures 4-6
Mathematics for Computer Science, chapters 2, 5, 7
236/240 course notes, chapters 1, 4
How to Read and Do Proofs
Learning to Reason, chapter 2

(weak) induction
strong induction
inductive definitions
structural induction
well-ordering principle

Diagonalization and the Halting Problem

lecture 7
Mathematics for Computer Science, chapters 4.1, 8.1–8.2
Learning to Reason, chapter 3
countability
diagonalization
halting problem

Correctness and Analysis of Iterative and Recursive Algorithms

lectures 8-11
Mathematics for Computer Science, chapter 22
236/240 course notes chapters 2, 3
Introduction to Algorithms, chapters 2, 3, 4

worst case and average case time complexity of algorithms

upper bounds and lower bounds on time complexity of algorithms
worst case analysis of iterative algorithms
preconditions, postconditions
partial correctness, termination, total correctness,
loop invariants
correctness of iterative algorithms
correctness of recursive algorithms
divide and conquer algorithms
worst case analysis of recursive algorithms
solution of recurrences:
- guess and verify
- plug and chug
- divide and conquer recurrences
- Master theorem
- linear recurrences
- domain and range transformations

Languages and Automata Theory

lectures 11-13
An Introduction to Formal Languages and Automata, chapters 2-4
236/240 course notes, chapter 7

regular expressions
deterministic and nondeterministic finite automata
subset construction
closure results
proof of equivalence of finite automata and regular expressions
proving languages nonregular: pumping lemma

Grading Scheme

- 50% Homework Assignments
- 20% Midterm
- 30% Final Exam

There will be 10 homework assignments, each worth 5% of your final grade. They are due on Thursdays at 11:59pm EST. The due dates are posted on the Timetable page. Your name, student number, and all other required information (see Policy on Collaboration and Use of Other Resources) must appear on the first page of each assignment.

The midterm will be on Wednesday February 26 from 3:10pm to 5:00pm and is worth 20% of your final grade.

Each assignment must be typeset and submitted as a single PDF file on MarkUs

Links to an external site.. Assignment number n must be named "CSC240an.pdf" and have the correct file extension. Only PDF files will be accepted. Scanned handwritten assignments, .jpg files, and .doc files will NOT be accepted. (If you write your assignment using Word, make sure you export it as a .pdf file and submit the resulting .pdf file. Do NOT simply change the extension on the file name from .doc to .pdf.) Proofread the PDF files you are submitting, to make sure that there weren't any special characters that have disappeared. It is your responsibility to ensure that your assignment has been submitted properly. Make sure to leave yourself sufficient time for uploading the assignment before the due date. The Student Guide to MarkUs Links to an external site. provides further documentation.

Assignments that are between 1 minute and 1 hour late will lose 10% of the total grade for the assignment.

Assignments that are more than 1 hour late, but at most 8 hours late will lose 25% of the total grade for the assignment.

Assignments that are more than 8 hours late will not be accepted.

The only exceptions must be for good reasons (such as illness) and must be approved by Professor Ellen at least 14 hours in advance.

The latest submitted version will be the one graded. If you submit an assignment very close to the deadline, you can leave a comment requesting that the last version submitted by the deadline be graded instead.

Questions concerning the grading of assignments and the midterm must be submitted **online via MarkUs**

Links to an external site. within one week of the date the item was graded.

There will be a quiz before each tutorial. It will be made available after lecture and must be submitted by 2:00pm on Friday. Quizzes must be submitted on MarkUs, as a single PDF file named "CSC240qn.pdf" where n is the quiz number. No late submissions will be accepted. The solution to each quiz will be discussed during tutorial. By 4:00pm on Monday, each student is required to do a peer review of the quiz done by a randomly assigned classmate. This involves giving it a rating:

- 3: perfect
- 2: only minor mistakes
- 1: at least one major mistake
- 0: not a reasonable attempt

If a rating of 2 is given, at least one mistake must be pointed out.
If a rating of 1 is given, at least one major mistake must be pointed out.

Quizzes will not be graded, but bonus marks will be given to students who submit reasonable attempts and do peer reviews, as follows:

- 5 bonus marks: all 10 quizzes and peer reviews completed

- 4 bonus marks: 8–9 quizzes and peer reviews completed
- 3 bonus marks: 6-7 quizzes and peer reviews completed
- 2 bonus mark: 4-5 quizzes and peer reviews completed
- 1 bonus mark: 2–3 quizzes and peer reviews completed

There will be a 3 hour in person final exam worth 30% of your final grade.
It will be scheduled during the final examination period.

Final grades may be adjusted up or down to conform with University of Toronto grading policies.